IN THE CLAIMS:

1.-24. (Cancelled)

25. (New) An optical transmission system that includes an optical transmitter and an optical receiver connected to the optical transmitter via an optical fiber, and outputs a radio-frequency electrical signal having a radio frequency from the optical receiver, the optical transmitter comprising:

an electrical/optical converter operable to generate an intermediate-frequency optical signal that has been intensity-modulated based on an intermediate-frequency electrical signal having an intermediate frequency different from the radio frequency, and output the generated intermediate-frequency optical signal to the optical receiver via the optical fiber,

the optical receiver comprising:

a frequency converter operable to generate a first radio-frequency optical signal and a second radio-frequency optical signal by intensity-modulating and thereby frequency-converting the intermediate-frequency optical signal based on a local oscillator electrical signal having a constant frequency, the first and second radio-frequency optical signals each including an intensity-modulated component having the radio frequency and a noise component, the intensity-modulated components being in antiphase, and the noise components being in phase; and

a balanced optical/electrical converter operable to generate a radio-frequency electrical signal by converting the first radio-frequency optical signal to a first electrical signal, converting the second radio-frequency optical signal to a second electrical signal, inverting a

phase of the first electrical signal, and adding the first electrical signal to the second electrical signal so that noise components of the first and second electrical signals are cancelled out.

26. (New) The optical transmission system of Claim 25, wherein

the local oscillator electrical signal has a frequency based on which the intermediate-frequency electrical signal is frequency-converted to the radio-frequency electrical signal.

27. (New) The optical transmission system of Claim 26, wherein the optical transmitter further comprises:

a second electrical/optical converter operable to generate a local oscillator optical signal that has a wavelength different from a wavelength of the intermediate-frequency optical signal and has been intensity-modulated based on the local oscillator electrical signal having the constant frequency; and

a multiplexer operable to generate a multiplexed optical signal by multiplexing the intermediate-frequency optical signal generated by the electrical/optical converter with the local oscillator optical signal generated by the second electrical/optical converter, and output the multiplexed optical signal to the optical receiver via the optical fiber, and

the optical receiver further comprises:

a separation unit operable to separate the multiplexed optical signal into the intermediate-frequency optical signal and the local oscillator optical signal; and

an optical/electrical converter operable to convert the local oscillator optical signal to the local oscillator electrical signal.

28. (New) The optical transmission system of Claim 27, wherein

the frequency converter consists of a Mach-Zehnder type external modulator.

29. (New) An optical transmission method used in an optical transmission system that includes an optical transmitter and an optical receiver connected to the optical transmitter via an optical fiber and outputs a radio-frequency electrical signal having a radio frequency from the optical receiver, the optical transmission method comprising the steps of:

in optical transmitter,

generating an intermediate-frequency optical signal that has been intensity-modulated based on an intermediate-frequency electrical signal having an intermediate frequency different from the radio frequency, and outputting the generated intermediate-frequency optical signal to the optical receiver via the optical fiber, and

in the optical receiver,

generating a first radio-frequency optical signal and a second radio-frequency optical signal by intensity-modulating, and thereby frequency-converting, the intermediate-frequency optical signal based on a local oscillator electrical signal having a constant frequency, the first and second radio-frequency optical signals each including an intensity-modulated component having the radio frequency and a noise component, the intensity-modulated components being in antiphase, and the noise components being in phase; and

generating a radio-frequency electrical signal by converting the first radio-frequency optical signal to a first electrical signal, converting the second radio-frequency optical signal to a second electrical signal, inverting a phase of the first electrical signal, and adding the

first electrical signal to the second electrical signal so that noise components of the first and second electrical signals are cancelled out.

30. (New) The optical transmission method of Claim 29, wherein

the local oscillator electrical signal has a frequency based on which the intermediate-frequency electrical signal is frequency-converted to the radio-frequency electrical signal.

31. (New) The optical transmission method of Claim 30 further comprising the steps of:

in the optical transmitter,

generating a local oscillator optical signal that has a wavelength different from a wavelength of the intermediate-frequency optical signal and has been intensity-modulated based on the local oscillator electrical signal having the constant frequency; and

generating a multiplexed optical signal by multiplexing the intermediate-frequency optical signal with the local oscillator optical signal, and outputting the multiplexed optical signal to the optical receiver via the optical fiber, and

in the optical receiver:

separating the multiplexed optical signal into the intermediate-frequency optical signal and the local oscillator optical signal; and

converting the local oscillator optical signal to the local oscillator electrical signal.

32. (New) The optical transmission method of Claim 31, wherein

the step of generating the first radio-frequency optical signal and the second radio-frequency optical signal by intensity-modulating and thereby frequency-converting the intermediate-frequency optical signal based on the local oscillator electrical signal is performed with use of a Mach-Zehnder type external modulator.